Mental Health of Early Adolescents from High-risk Neighborhoods: The Role of Maternal HIV and Other Contextual, Self-Regulation, and Family Factors

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Objectives   To examine the effect of maternal HIV infection, as well as other individual, family, and contextual factors on the mental health of inner-city, ethnic minority early adolescents.
Methods   Participants included 220 HIV-negative early adolescents (10–14 years) and their mothers, half of whom were HIV-infected. Individual interviews were conducted regarding youth depression, anxiety, externalizing and internalizing behaviour problems, as well as a range of correlates of youth mental health guided by a modified version of Social Action Theory, a theoretical model of behavioral health.   **Results**   Although the HIV status of mothers alone did not predict youth mental health, youth knowledge of mother's HIV infection and mother's overall health were associated with worse youth mental health outcomes, as were contextual, self-regulation, and family interaction factors from our theoretical model.   **Conclusions**   There is a need for family-based mental health interventions for this population, particularly focusing on parent–child relationships, disclosure, and youth self-esteem.

Key words   HIV-affected children; HIV; mental health; parent–child relationship.

Early adolescence may be a vulnerable period for the development of mental health problems due to biological, social, and psychological changes as youths transition from late childhood to adolescence (Hamburg, 1990). Early adolescents are beginning to move from childhood to adulthood looking for guidelines to define their new status. Studies have identified this stage as a period of heightened risk for the development of emotional and behavioral problems, such as depressed mood (Clarizio, 1994; Heath & Camarena, 2000). Early adolescents with HIV+ mothers may be at particular risk for mental health problems (Havens & Mellins, in press; Mellins, Kang, Leu, Havens, & Chesney, 2003). They are often exposed to urban stress, substance use, and unstable family functioning. Moreover, they must cope with a highly stigmatized, chronic, and potentially fatal illness in a parent as they transition through a challenging period of development. This study examines the impact of maternal HIV, as well as other youth and family psychosocial factors on the mental health of a sample of uninfected inner-city, early adolescents.

Unfortunately, the literature on the impact of maternal HIV on uninfected early adolescent mental health is limited. Most studies have focused on elementary school age children who have presented with internalizing and externalizing behavior problems, low self-esteem, and depressive symptoms (Bauman, Camacho, Silver, Hudis, & Draimin, 2002; Dorsey et al., 1999; Forehand et al., 2002). The few studies on adolescents suggest that they have elevated levels of behavioral problems, and depressive and anxiety disorders (Lester et al., 2006; Nostlinger, Bartoli, Gordillo, Roberfroid, & Colebunders, 2006). However, most studies have included only uninfected youths with HIV+ mothers without any kind of comparison group, such as uninfected youths without HIV+ mothers from similar socioeconomic communities. Such comparison groups are important for disentangling the role of parental HIV as compared to the role of the myriad other

factors that might influence mental health in multi-stressed populations. In one of the few studies utilizing a comparison group, children (6–11 years) with HIV+ mothers had worse mental health outcomes than children with uninfected, presumably healthy mothers from similar communities (Forehand et al., 1998, 2002). Additional studies that examine the impact of maternal HIV on adolescent mental health are necessary given that mental health problems typically begin to emerge in vulnerable populations during adolescence.

In addition to understanding the role of maternal HIV in influencing youth mental health, studies need to examine other factors that could inform interventions for this population. The majority of these youths live in inner-city impoverished communities where HIV is most prevalent (CDC, 2007). A number of studies have linked poverty and urban stress to child mental health problems, including externalizing behavior problems, depression, and anxiety (Gonzalez, 2005; McLeod & Shanahan, 1993). Also, given the epidemiology of HIV in women (CDC, 2007), youths with HIV+ mothers are typically of ethnic minority status (78% of women with HIV in the US are Black or Latino) and at high risk for exposure to parent drug abuse (26% of women with HIV have injection drug use, IDU, as a risk factor, or are the partners of an IDU). Thus, they may have experienced racism, discrimination, and stigma even before maternal HIV (Havens & Mellins, in press).

Moreover, the high rates of comorbid psychiatric and substance use disorders in HIV+ women of child bearing age, the potential heritability of these disorders, and the stressful family and social environments associated with parent psychiatric illness and substance use, as well as HIV represent risk factors that may place many youths with HIV+ mothers at high risk for mental health problems (Havens & Mellins, in press; Mellins et al., 2003; Morrison et al., 2002; Singer, Frakas, & Kliegman, 1992). Limitations in parenting capacities associated with deteriorating HIV-related illness, substance abuse or mental illness can be devastating to child mental health (Biggar et al., 2000; Dorsey, Chance, Forehand, Morse, & Morse, 1999).

Conversely, studies have found that in some families with HIV+ mothers, a good mother–child relationship, parental monitoring, and structure in the home are all variables that are related to better adjustment and mental health outcomes in youths (Dutra et al., 2000; Rotheram-Borus, Stein, & Lester, 2006). One of the few intervention studies evaluating the impact of a family-based intervention designed to help parents with AIDS and their adolescents (11–18 years) cope with illness-related tasks and reduce youth behavioral, social, and mental health symptoms over time, found a reduction in youth emotional distress as a result of the family intervention (Rotheram-Borus, Lee, Gwadz, & Draimin, 2001). Given the growing rates of HIV infection in women of child bearing age (Espinoza et al., 2007), and thus, the growing number of ''HIV-affected'' youths—identifying factors that reduce mental health symptoms in the context of maternal HIV, can inform the content of mental health interventions to promote well being in this population. For example, other studies of youths not necessarily affected by HIV have found factors such as self-esteem and future orientation to be related to enhanced mental health and better adjustment (Holman & Silver, 2005; Piko & Fitzpatrick, 2003; Portes & Zady, 2002).

This study examines the effect of maternal HIV infection and other psychosocial and contextual factors on mental health outcomes in a sample of inner-city, ethnic minority early adolescents (ages 10–14 years). The study is guided by a theoretical model of behavioral health, Social Action Theory (SAT; Ewart, 1991). In accordance with SAT, behavioral health outcomes (e.g., sexual and drug-risk behavior) are influenced by (a) the context in which behavior occurs including both internal context (e.g., biological state) and external context (e.g., environment), and (b) self-regulation processes that include both youth motivation and capabilities and the social interactions that influence self-regulation processes. We originally adapted the SAT model for this study to focus on key variables that might predict the behavioral health outcomes of sexual and drug use risk behavior in youth affected by maternal HIV, based on the limited studies on this population (Havens & Mellins, in press). Previous analyses from this study found that predictors from SAT, including contextual (e.g., child gender, household composition, and maternal characteristics) and self-regulation factors, including family interactions (self-esteem, HIV knowledge, and supervision) were predictive of youth sexual and drug use behavior (Mellins, Dolezal, Brackis-Cott, Nicholson, & Meyer-Bahlburg, 2007).

In addition to risk behavior, we also adapted the SAT model to examine a third behavioral health outcome, mental health. Thus, in this article, we present secondary data analyses focused on key constructs from the modified SAT model that we hypothesize will be associated with mental health problems. We examined contextual factors including internal context (youth age, ethnicity, gender, and pubertal development) and external context. The latter includes mother's health and function (HIV status, health impairment, and mental health), mother demographics

(income, education, employment, presence of partner, and availability of other support), and youth stress as indicated by experiences of victimization. We also examined self-regulation processes including future educational orientation and self-esteem. Finally, as an indicator of the social interactional factors that influence self-regulation and behavior, we focused on family factors (e.g., parent–child relationship, communication). We have two hypotheses: (a) uninfected youths with HIV+ mothers will present with more mental health problems, including internalizing (e.g., depression and anxiety) and externalizing behavior problems, and among youth with HIV+ mothers, those who know their diagnosis will have more mental health problems than those who do not; and (b) in the total sample, youth mental health problems will be predicted by the contextual, self-regulation, and family/social interaction factors described earlier.

Methods
Participants

Data for this secondary analysis come from the baseline interview of a longitudinal study on the impact of maternal HIV disease on uninfected early adolescents. Research participants included 220 HIV-negative early adolescents and their mothers from two groups: (a) mothers who are HIV+ ($n = 100$) and (b) mothers who are uninfected or who do not know their HIV status ($n = 120$). Mother–child dyads were eligible if the participants spoke English or Spanish, the youth was between 10 and 14 years of age, the mother was the birth parent of the youth, and the mother and youth had lived together for at least the past 6 months. Participants were recruited from sites located in inner-city neighborhoods with high HIV sero-prevalence in order to recruit participants in both groups from similar sociodemographic backgrounds. HIV+ mothers were recruited from (a) HIV care clinics at two medical centers, (b) two community-based organizations (CBOs) (one for HIV+ women only), and (c) a network of HIV-care providers. HIV- mothers were recruited from (a) a general pediatric clinic at the same medical center as one of the HIV clinics and (b) one of the CBOs that treated both HIV+ and HIV− mothers. Recruitment procedures included posting fliers and approaching potential participants in waiting rooms to describe the study. In HIV clinics, to preserve confidentiality of HIV status, primary care providers approached the potential participants to assess eligibility and interest in the project before referring them to the research team.

To confirm eligibility, a brief telephone screening was conducted after recruitment. The screening contained questions on the mother's demographics, HIV testing of mother and results (if she was willing), and child's knowledge of mother's HIV status for the HIV+ group (to prevent inadvertent disclosure). All mothers were willing to share the results of their HIV tests or tell us if they had not been tested. Of the 294 eligible families approached for the study, 41 (14%) refused to participate primarily due to time constraints, and 33 (11%) frequently cancelled or failed to show up for interviews. The remaining 220 (75%) families completed the baseline interview. This is a sample of convenience with no data on the participants who were not approached or who refused to participate, given issues of confidentiality.

Procedures

The mother and youth received separate, simultaneous, individual interviews lasting 1–2 hr. All of the youths' interviews were administered in English; the mothers were interviewed in English or Spanish. The majority of instruments had been validated for use with inner-city, ethnic minority populations. When Spanish versions were not available from the publisher, translation was completed by using standard procedures for translation/back translation by separate reviewers (Preciago & Henry, 1997). Specifically, one bilingual research assistant translated all of the English language measures into Spanish, and then a second bilingual research assistant translated the new Spanish language measures back into English. Any inconsistencies were settled by group consensus.

Interviews were administered by trained interviewers, the majority of whom were bilingual and of similar ethnicity as the participants. This study received Institutional Review Board approval. All mothers provided written informed consent for themselves and their children; children provided written assent. Monetary reimbursement for time and transportation was provided.

Measures

Child Mental Health Outcomes

Children completed the Child Depression Inventory (CDI; Kovacs, 1992) and the trait scale of the State Trait Anxiety Inventory-Child version (STAI-C; Spielberger, 1973). The CDI is a 27-item measure that assesses the intensity of depression symptoms in children (Kovacs, 1992). For each item, the child selects one of three sentences that best describes his/her feelings over the past 2 weeks. A total score is calculated ranging from 0 to 54 (α for our sample $= .77$). The trait scale of the STAI-C is a self-report measure widely used to assess trait anxiety, permitting the identification of subjects who are prone

to generalized anxiety. The trait scale consists of 20 items, each rated on 3-point Likert scales reflecting the degree to which the child experiences each symptom (α for our sample = .85). Adequate reliability and validity have been established for both measures (Kovacs, 1992; Spielberger, 1973). Mothers reported on child behavioral problems using the well-validated Child Behavior Checklist-Parent Version for ages 4–18 years (CBCL-P; Achenbach, 1991). Parents rate on a 3-point scale how ''true'' the items are in describing their child's behavior. Standardized scores, based on age and gender are computed. Adequate psychometric properties have been established for total Internalizing (e.g., anxiety, depression) and Externalizing Behavior Problem (e.g., aggression, delinquency) scales (Achenbach, 1991). Alphas for these scales in our sample were .90 and .92, respectively.

Contextual Predictors

Mother's HIV Status and Youth Knowledge of Mother's HIV Status. Mothers were asked several questions about personal HIV-tests and the results. They were also asked what the target child knew about their HIV status. For data analysis, mother's HIV status was treated as a dichotomous variable (HIV infected vs. uninfected or untested). Youth knowledge of mother's HIV status was also dichotomized (disclosure vs. not disclosed).

Mother's Health. We assessed physical health impairment of both groups of mothers. A physical health impairment composite score that incorporated questions on physical impairment in activities of daily living as well as number of days hospitalized in the past year was computed. Self-report data on CD-4 and viral load were not uniformly available for the HIV-infected mothers.

Demographics. Mothers reported their age, ethnicity, income, employment, and whether they lived with a partner. Children reported their age, gender, and ethnicity.

Maternal Mental Health. Mothers completed the Beck Depression Inventory (BDI: Beck, 1987) and the trait scale from the adult STAI (Spielberger, 1987). The BDI provides a 21-item self-report measure of the presence and intensity of depressive symptoms, including depressed mood, loss of interest, guilt, suicidality, and vegetative changes (α for our sample = .89). The trait scale of the adult STAI consists of 20 4-point Likert-format items that assess an individual's tendency to experience anxiety states (α for our sample = .92). Adequate psychometric properties have been established for both measures in prior studies (Beck, 1987; Spielberger, 1987).

Maternal support was assessed with questions on: ''Who is there for you when you need help with child care, supervision of your child, running errands, extra money,

going to medical appointments for yourself or your child?'' The score is the total number of nonduplicative people.

Youth Victimization was assessed with 7 items from Monitoring the Future (Johnston, Bachman, & O'Malley, 1993), a survey developed at the University of Michigan for the National Institute of Drug Abuse that provides a comprehensive assessment of risk behaviors. Youths were asked if they had been victimized in the past year (e.g., has something of yours been stolen, has someone deliberately damaged your property, has someone injured you on purpose) on a Likert scale of 0 (not at all) to 4 (five or more times). A total score was created.

Youth perception of pubertal development was assessed with one question from the Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1987): ''Do you think your development is any earlier or later than other girls/boys your age?'' Response choices were ''much earlier or later'' versus ''somewhat earlier or later'' versus ''about the same.''

Self-regulation

Youth self-esteem was assessed with the Tennessee Self-Concept Scale-2 (TSCS-2; Fitts & Warren, 1996). The TSCS-2 assesses youth perception of identity, self-satisfaction, and behaviors within several domains (personal, family, academic, and social self-esteem). In this study, we used a 37-item total score (α for our sample = .84). The TSCS-2 has excellent psychometric properties and was standardized on a child population, 50% of whom were Black or Latino (Fitts & Warren, 1996).

Future Educational Orientation. One question from Monitoring the Future survey (see above) was used to assess future goals for school, ''How likely is it that you will graduate college?''

Parent–child Relationship. Mothers completed Parent Child Relationship Inventory (PCRI; Gerard, 1994). Two PCRI subscales were included in analyses: (a) parental involvement (α = .85) and, (b) communication (α = .81). Good psychometric properties have been reported for these scales in other studies as well (Gerard, 1994).

Data Analysis

We examined the association between child mental health outcomes and both contextual influences and self-regulation processes, first using bivariate analyses—Pearson correlations for continuous independent variables and *t*-tests for comparing independent samples. Second, for each mental health score, two sets of predictors were separately examined in multiple regression analyses (a) contextual variables and (b) self-regulation variables. The backwards approach was used to determine the relative

association of multiple variables within a single domain. Backward selection procedure is preferred to forward selection procedure when the predictor variables are far from statistically independent as is the case with these data, allowing us to see which variables within each domain are most predictive of mental health scores (Mantel, 1970).

Results
Descriptive Data

Table I presents demographic data for both groups of participants. Fifty-one percent of the children were males. Their mean age was 12.1 years (range = 10–14 years). Approximately half of the dyads had Latina mothers (51% of whom were interviewed in Spanish); the remainder was predominately African-American. Dyads with HIV+ mothers versus HIV− mothers were compared on all independent variables (contextual influences, which include demographics, and self-regulation processes), with only four group differences. HIV+ mothers had higher BDI scores, more health problems (as would be expected), and were less likely to be Latina, and more likely to be unemployed. Also, mothers were asked to report on substance abuse in the past 6 months. Only six (three HIV+ and three HIV−) met criteria for an alcohol or drug abuse diagnosis, too few to include in further analyses.

Table I. Sample Description by HIV-Status of Caregiver

	HIV − caregiver (N = 120)	HIV + caregiver (N = 100) N (%)
Youth female	57 (48)	51 (51)
Mother Latina**	70 (58)	39 (39)
Mother employed**	45 (38)	20 (20)
Mother lives with partner	41 (34)	36 (36)
	Mean (SD)	Mean (SD)
Youth age	12.0 (1.4)	12.2 (1.3)
Mother age	38.3 (6.4)	37.9 (5.6)
Youth victimization	1.4 (1.6)	1.3 (1.5)
Youth pubertal development	1.7 (0.7)	1.6 (0.8)
Household income (month)	1265 (856)	1233 (561)
Mother physical health**	−0.1 (0.8)	0.2 (0.8)
Mother social support	2.9 (4.0)	2.9 (2.6)
Mother depression*	9.3 (9.6)	12.1 (9.1)
Mother anxiety	19.5 (12.1)	21.6 (11.4)
Parent–child communication	3.2 (0.4)	3.1 (0.4)
Parent–child Involvement	3.3 (0.4)	3.3 (0.4)
Youth autonomy	2.4 (0.4)	2.3 (0.4)
Future education Intentions	3.7 (0.5)	3.7 (0.6)
Youth self-esteem	4.1 (0.4)	4.2 (0.4)

*$p < .05$; **$p < .01$; chi-square tests for dichotomous variables, otherwise t-tests.

Primary Analyses

Mental health and the role of maternal HIV Status

Table I also presents data on the mental health outcomes for each group of youth separately. The data do not support our first hypothesis. Adolescents with HIV-infected mothers did not differ from those with uninfected mothers on any of the mental health scores. Overall, the majority of youth had CDI and CBCL scores in the normative range. Fifteen percent ($n = 33$) of the youth had CDI scores greater than 11, often considered a clinical cut-off for Depression and only 8% ($n = 18$) of the youth had CBCL Internalizing T-scores of 70 or higher (considered a clinical a cut-off) and 9% ($n = 19$) for CBCL Externalizing T-scores of 70 or higher. There are no clinical ranges provided for the STAI. Because there were no groups differences due to maternal HIV status, we did not control for mother's HIV status in the analyses examining predictors from the SAT model (see below).

Among youths with HIV-infected mothers, we examined the impact of knowledge of maternal HIV status. Adolescents who knew the mother's status had significantly higher CDI depression scores than those who did not know. They did not differ on STAI-C anxiety or CBCL scores (Table I).

SAT Variables

Bivariate associations of SAT variables with mental health scores are shown in Table II (t-tests) and Table III (correlations for continuous variables). The results of the backwards stepwise regressions are shown in Table IV. Results are organized below by mental health outcome.

Predictors of Youth Depression. In bivariate analyses, higher levels of youth depression were significantly associated with both contextual and self regulation factors. *Contextual predictors* that were significantly related to youth depression were (a) older youth age, (b) greater youth experience of victimization, (c) lower household income, (d) more maternal health problems, and (e) higher maternal depression. The contextual influences remaining after the backwards stepwise regression included youth age and greater experiences of victimization. *Significant self-regulation process factors* associated with higher youth depression included (a) lower youth self-esteem and (b) less youth autonomy in parent–child relationships. Lower youth self-esteem remained significant in the multiple regression analyses examining the self regulation predictors.

Predictors of Anxiety. In bivariate analyses, higher youth anxiety scores were significantly associated with many of the same *contextual predictors* as youth depression, including (a) greater youth victimization, (b) lower household income, (c) more maternal health problems, and

Table II. *T*-tests Comparing Independent Samples on Mean Mental Health Scores.

	N	Depression Mean (SD)	CI[a]	Anxiety Mean (SD)	CI[a]	Internalizing Mean (SD)	CI[a]	Externalizing Mean (SD)	CI[a]
Mother HIV status									
Negative	120	6.7 (4.8)	−1.0, 1.7	35.2 (6.7)	−0.9, 2.7	53.3 (12.7)	−1.7, 4.8	52.8 (12.3)	−3.7, 2.5
Positive	100	6.3 (5.2)		34.3 (7.1)		51.7 (11.1)		53.4 (10.4)	
Youth aware of status[b]									
Knows	66	7.0 (6.0)	−3.7, −0.1*	34.0 (7.3)	−2.1, 3.9	51.7 (11.9)	−4.5, 4.9	54.2 (10.9)	−6.6, 2.1
Does not know	34	5.1 (3.1)		34.9 (6.7)		51.9 (9.6)		51.9 (9.2)	
Youth gender									
Male	112	6.3 (4.8)	−1.8, 0.9	34.6 (6.9)	−2.2, 1.4	52.9 (11.8)	−2.6, 3.9	52.6 (11.5)	−4.0, 2.1
Female	108	6.7 (5.1)		35.0 (6.9)		52.2 (12.3)		53.6 (11.5)	
Mother ethnicity									
Latina	111	6.7 (5.1)	−1.7, 0.9	35.3 (6.9)	−2.9, 0.8	55.0 (11.9)	−8.0, −1.7**	52.8 (11.6)	−2.5, 3.6
Non-Latina	109	6.3 (4.8)		34.3 (6.9)		50.2 (11.7)		53.4 (11.4)	
Mother employed									
Employed	65	5.6 (4.2)	−0.1, 2.8	34.3 (6.6)	−1.3, 2.7	48.4 (11.4)	2.5, 9.4***	50.4 (11.3)	0.4, 7.1*
Unemployed	154	6.9 (5.3)		35.0 (7.0)		54.4 (11.9)		54.2 (11.4)	
Mother partner status									
Lives with partner	77	6.0 (4.7)	−0.6, 2.2	34.8 (6.3)	−1.9, 1.9	49.8 (11.0)	0.9, 7.6*	50.5 (9.8)	0.8, 7.2*
Not with partner	142	6.8 (5.1)		34.8 (7.2)		54.1 (12.3)		54.5 (12.1)	

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$
[a]95% confidence interval of difference of means.
[b]Analysis restricted to those with HIV+ mother.

(d) more maternal mental health problems (depression and anxiety). In multiple regression analyses, two of the contextual influences remained significant, youth victimization and maternal depression. Youth anxiety was also associated with the same two *self-regulation variables* as in the depression analyses, lower youth self-esteem and less child's autonomy in parent–child relationships. Youth self-esteem remained significant in the regression analyses examining self-regulation factors.

Predictors of Internalizing Behavior Problems. In bivariate analyses, higher CBCL Internalizing *T*-scores were associated with very similar *contextual variables* including (a) greater youth victimization, (b) lower household income, (c) more maternal health problems, (d) higher maternal depression and anxiety, (e) less maternal social support, and (f) having a mother who was Latina, unemployed, and not living with a partner. In multiple regression analyses, the following contextual influences remained significant: younger youth age, greater youth victimization, lower household income, less maternal social support, and higher maternal depression.

In bivariate analyses, *self regulation processes* were associated with higher CBCL Internalizing *T*-scores including, (a) lower youth self-esteem and (b) less

Table III. Correlations with Mental Health Scores

	Depression	Anxiety	Internalizing	Externalizing
Contextual influences				
Youth age	.170*	−.087	−.133	.026
Mother age	.080	.051	.023	.047
Youth victimization	.305***	.194**	.248***	.275***
Youth pubertal development	−.052	.097	.056	.076
Household income	−.138*	−.185**	−.267***	−.133
Mother physical health	.188**	.195**	.171*	.194**
Mother social support	.029	−.095	−.242***	−.136*
Mother depression	.147*	.241***	.355***	.273***
Mother anxiety	.121	.205**	.294***	.234***
Self-regulation processes				
Parent-child communication	−.112	−.012	−.162*	−.224***
Parent-child involvement	−.105	−.101	−.237***	−.288***
Youth autonomy	−.159*	−.158*	−.246***	−.152*
Future educational intentions	−.127	−.032	.070	−.004
Youth self-esteem	−.585***	−.469***	−.265***	−.241***

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$.

Table IV. Variables Associated with Mental Health Scores in Backwards Stepwise Regressions

	Depression B (SE)	Anxiety B (SE)	Internalizing B (SE)	Externalizing B (SE)
Contextual influences				
Youth age	0.57 (0.24)*		−1.23 (0.53)*	
Youth victimization	1.03 (0.20)***	0.75 (0.30)*	1.66 (0.46)***	1.91 (0.47)***
Household income			−0.01 (0.01)**	
Maternal social support			−0.04 (0.01)**	
Mother depression		0.16 (0.05)***	0.35 (0.08)***	0.29 (0.08)***
Self-regulation processes				
Parent-child involvement			−6.52 (1.83)***	−7.20 (1.73)***
Future educational intentions			3.17 (1.41)*	
Youth self-esteem	−6.83 (0.64)***	−7.57 (0.97)***	−7.44 (1.81)***	−5.72 (1.72)***

*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

child's autonomy. Family interactional variables that influence self-regulation, including less parent–child communication and involvement were also associated with worse CBCL scores. In the regression equations, greater youth future educational orientation, lower youth self-esteem, and less parental involvement were significant.
Predictors of Externalizing Behavior Problems. In bivariate analyses, higher CBCL Externalizing *T*-scores were significantly related to several *contextual variables*, (a) greater youth victimization, (b) worse maternal health problems, (c) less maternal social support, (d) higher maternal depression and anxiety, (e) maternal unemployment, and (f) mothers *not* living with a partner. In regression analyses, only two of the six contextual influences remained significant, youth victimization and maternal depression.

Higher CBCL Externalizing *T*-scores were also associated with the following *self-regulation processes*: (a) lower youth self-esteem and (b) worse scores on three of the PCRI domains (parent–child communication, involvement, and youth autonomy in parent–child relationships). In regression equations, lower parental involvement and youth self-esteem remained significant in the self-regulation predictor set.

In summary, similar contextual and self-regulation factors were associated with each of the four indices of youth mental health in bivariate analyses. In regression equations, youth victimization and maternal depression were the contextual factors and lower youth self esteem was the self-regulation factor that were the most consistently associated with worse youth mental health outcomes.

Discussion

Due to the steadily increasing rates of HIV infection in women of child-bearing age, HIV/AIDS has become a major worldwide threat to not just physical health, but the psychosocial well-being of children and adolescents (Havens & Mellins, in press). A few previous studies suggest that children living with HIV-infected parents are at great risk for mental health problems (Dorsey et al., 1999; Forehand et al., 2002; Lester et al., 2006). The present study examined the effect of maternal HIV on early adolescent mental health, comparing uninfected youth with and without HIV+ mothers, from similar low SES communities. Contrary to our first hypothesis, group differences in mental health outcomes due to maternal HIV were not found, even though HIV+ mothers themselves reported more symptoms of depression than HIV− mothers. In fact, both groups of youth from highly vulnerable impoverished inner-city backgrounds presented with mental health symptom scores in the normative range (Achenbach, 1991; Kovacks, 1992). These data imply that maladjustment is not always the response to the many stressors experienced by this population, including poverty, parental illness, violence, and family disruptions.

As noted, few studies have examined the influence of maternal HIV infection on child psychosocial functioning using appropriate comparison groups. Based on a comparison of group of youths from similar socioeconomic backgrounds to our target sample, our findings suggest that maternal HIV status alone may not be the most important correlate of mental health in youths affected by maternal HIV. Other factors experienced by inner-city youth populations may be more critical for psychosocial functioning. For example, HIV is not the only life threatening or chronic health condition that affects mothers, particularly in impoverished urban communities. Poor cardiac functioning, asthma, diabetes, and severe substance abuse have been found to be extremely prevalent and may result in poor youth mental health (Wise, Carmichael, Belar, Jordan, & Berlant, 2001). Although the HIV+ mothers reported more impairment due to health problems in our study, youths in both groups may

have been affected by their mother's health problems and thus, few differences were found due to maternal HIV status alone. In our study, worse maternal physical health impairment was associated with increases in both youth self-reported depression and mothers' reports of youth internalizing behavior problems. Unfortunately, we did not collect data on specific health conditions other than HIV to examine the rates of other health conditions in both groups.

Also, increased access to antiretroviral treatment has dramatically reduced parent mortality. Because all of the youths were living with their birth mothers, we could not examine the impact of maternal death, a known predictor of poor child mental health outcomes (Luthar & Cicchetti, 2000). As HIV+ mothers live longer with improved quality of life, the impact of maternal HIV on children may dissipate and other stressors may become better predictors of behavioral problems.

That said, among youth with HIV+ mothers, youth knowledge of mother's HIV status was associated with youth report of more depressive symptoms. Thus, a child's awareness of his/her mothers' HIV status may be one critical factor in understanding the mental health impact of maternal HIV. Although providers often encourage disclosure of mother's HIV status to children, particularly adolescents (Havens & Mellins, in press), youth may need more support than is typically available during and after this process as several studies including this one suggest worse outcomes among youth who know their mother's diagnosis (Lee, Lester, & Rotherum-Borus, 2002; Murphy, Marelich, & Hoffman, 2002). We did not collect data on the disclosure process such as how children were told, by whom, and at what stage of development, nor could we look at interactions between disclosure and other factors such as maternal mental health given the small sample size. Furthermore, we only had mothers' reports of disclosure. There may have been additional youths who suspected their mother's HIV diagnosis.

In addition to maternal HIV, this study examined contextual and self-regulation factors that might influence the mental health of ethnic minority youths living in urban communities, using a modified SAT model. Consistent with the second hypothesis, contextual and self-regulation factors were predictors of one or more mental health outcome variables among youths in this study across groups, with many consistencies across domains of mental health. In multiple regression analyses, there were three contextual factors that were the most consistent predictors of mental health from among all the contextual factors. Older youth age, youth victimization, and greater maternal depression were associated with both youth and maternal reports of increased youth mental health problems. Youth age has been consistently linked to mental health or behavioral problems, particularly as youth progress from childhood to adolescence (Heath & Camarena, 2000). Although the rates of abnormal scores were low in this sample, following this group into older adolescence may be critical for understanding their mental health risk.

Furthermore, these data also correspond with a number of studies that link maternal and child depression (Hammen, Shih, & Brennan, 2004; Wiliamson, Walters, & Shaffer, 2002). Although we did not find group differences in rates of depression in the youth, HIV+ women did have higher rates of depression, and maternal depression was related to youth depression. Given that studies have reported higher rates of mental health problems, particularly depression in HIV+ women, the early adolescents in this study may be at heightened genetic risk for future depression that has not emerged yet (Morrison et al., 2002; Murphy et al., 2002). Although mothers' reports of substance abuse were low in our sample, other studies have reported higher rates of substance abuse in HIV+ women (Mellins et al., 2003) and thus, future research should examine the impact of parental substance use on child mental health in this population.

Our finding that greater experience of youth victimization was related to greater youth depression, anxiety, and behavioral problems was not surprising. Other studies have found the experience of victimization in childhood and/or adolescence to be related to poor mental health and substance use (Estevez, Musitu, & Herrero, 2005; Turner, Finkelhor, & Ormrod, 2006). In addition, there is evidence that children from racial and ethnic minority families, low income households, or single parent homes, as well as children who have parents with lower education experience more victimization than higher status peers (Turner et al., 2006).

In addition to contextual factors, self-regulation factors were also associated with youth mental health problems. Not surprisingly, youth self-esteem was consistently associated with youth mental health problems. Youths with higher self-esteem reported fewer mental health problems, as in previous literature (Portes & Zady, 2002). In our SAT Model, we also posit that self-regulation is influenced by family interactional processes. There were two family factors that were significantly associated with better mental health. More specifically, children reported less anxiety and mothers reported fewer child internalizing and externalizing problems when the parent–child relationship was better. These data, along the data on

maternal depression, underscore the importance of mothers' influence on early adolescent mental health. They also support in part family-based approaches to interventions that have become more prevalent in the field of child mental health (Pequegnat & Szapocznik, 2000).

In addition to those previously mentioned, the following limitations should be considered when interpreting our results. Participants were recruited from HIV primary care clinics, CBOs, and HIV care providers. This sample of convenience may not reflect the larger population of early adolescents with HIV+ mothers. Although we attempted to recruit both groups from similar communities based on the demographics of maternal HIV disease, other factors (e.g., differential rates of study refusal or access to services) may have reduced the effect of maternal HIV. Due to issues of confidentiality, no data were collected on participants who refused to participate or who were not approached. Furthermore, we did not match groups on key study variables. However, with the exception of only two maternal demographics (ethnicity and employment), there were no group differences in other key study demographic variables (Table I). Additionally, the data may have been affected by issues of social desirability and other biases related to self-report instruments. However, the consistency in predictors of both youths and mothers' reports of early adolescent mental health outcomes support in part the validity of our measures.

Given the relatively small sample size, we could not examine constructs from the full SAT model (e.g., other self regulation factors such as capabilities, the role of other social interactional factors such as peers), nor could we examine interactions and the impact of multiple domains from the model simultaneously. However, the significance of a large number of internal and external contextual factors suggests the utility of SAT for understanding predictors of not only risk behavioral health outcomes, but also mental health outcomes and highlights the need for theoretical models of health behavior to focus on context as well as self regulation. These models have often focused on individual cognitive skills, neglecting the larger social context and family factors that may be crucial determinants of adaptive function and risk behaviors (Ewart, 1991). Research is needed with a larger sample of youth affected by maternal HIV to further evaluate the utility of the full SAT model, including examination of potential interaction effects. It would also be important to examine the usefulness of the SAT model in predicting mental health and health risk behaviors together as both are likely to influence each other and may have a common set of predictors. Such data would be important for

designing effective psychosocial interventions for this population.

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